I CLAIM:

1. A method of transmitting bidirectional communication data over a single optical fiber comprising the steps of:

transmitting a first NRZ data stream having a first clocking frequency from a first location to a second location by said optical fiber using a carrier having a selected wavelength of light;

receiving said selected wavelength of light from said first location at said second location and recovering said NRZ data stream;

receiving a second NRZ data stream having said first clocking frequency at said second location;

converting said second NRZ data stream to a Manchester coded data stream at a second clocking frequency which is a selected multiple of said first frequency;

transmitting said Manchester coded data stream from said second location to said first location by said optical fiber at said selected wavelength of light;

receiving said Manchester coded data stream at said first location; and

converting said Manchester coded data stream to an NRZ data stream having said first frequency.

2. The method of claim 1 wherein said second clocking frequency is three times (3x) said selected clocking frequency.

Sub a1 3. The method of claim 2 wherein said Manchester coded data stream includes three (3) pulses for each data bit and further comprising voting said three (3) pulses to determine at least two (2) equivalent pulses and providing an output NRZ

data bit at said first frequency equivalent to said at least two (2) equivalent Manchester data bits.

4. The method of claim 2 wherein said selected clocking frequency is about 25 MHZ.

~~5. The method of claim 1 wherein said second clocking frequency is two times (2x) said selected clocking frequency.~~

Sub a2 6. The method of claim 1 and further including the step of filtering said first NRZ data stream with a low pass filter prior to said transmitting step.

7. Apparatus for transmitting bidirectional communication data over a single optical fiber comprising:

a first data source for providing a first electrical digital data stream coded as an NRZ data stream and at a selected clocking pulse rate;

a first light generator at a first location for generating light at a selected wavelength, said light generator connected to said first data source for receiving said NRZ coded data stream and for modulating light generated by said first light generator with said NRZ coded data;

an optical fiber extending from said first location to a second location for transmitting bidirectional light therebetween;

a first light detection device at said second location for receiving said light modulated by said NRZ coded data stream and for recovering said NRZ coded electrical digital data stream;

a second data source for providing a second electrical digital data stream coded as an NRZ data stream at said selected clocking pulse rate;

a source for providing clocking pulses at said selected clocking pulse rate;

a clock multiplier for multiplying said selected clocking pulse rate at least two times (2x);

a Manchester coding device connected to said clock multiplier for receiving said NRZ coded data stream and for converting said NRZ coded data stream at said selected clocking pulse rate to a Manchester coded data stream having pulses at a clocking pulse rate at least twice said selected clocking pulse rate;

a second light generator at said second location for generating light at said selected wavelength, said second light generator connected for receiving said Manchester coded electrical digital data stream and for modulating light generated by said second light generator with said Manchester coded data stream;

a second light detection device at said first location for receiving said light modulated by said Manchester coded electrical digital data stream and for recovering said Manchester coded electrical digital data stream; and

Manchester decoding device for receiving said Manchester coded electrical digital data stream and converted said received data stream to an NRZ coded data stream at said selected clocking pulse rate.

~~8. The apparatus of claim 7 wherein said clock multiplier provides output~~ clocking pulses which are three times (3x) said selected ~~clocking~~ pulses.

9. ~~The apparatus of claim 7 wherein said clock multiplier provides output clocking pulses which are two times (2x) said selected clocking pulses.~~

Sub a3> 10. The apparatus of claim 8 and further including ~~a first low~~ pass filter between said first data ~~source~~ and said first generator and a second low pass filter ~~located after~~ said first light detection means.

B1 cont.

11. The apparatus of claim 10 and further including a first band pass filter between said Manchester coding device and said second light generator and a second band pass filter between said second light detection device and said Manchester decoding device.

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